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JOURNAL SPOTLIGHT

Dynamic Acquisition of ^{99m}Tc-Pyrophosphate SPECT/CT Images in Transthyretin Cardiac Amyloidosis: A Pilot Study

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^{99m}Tc-pyrophosphate is commonly used to diagnose and stage Transthyretin Cardiac Amyloidosis (ATTR-CM). The study aimed to determine the timing of peak ^{99m}Tc-pyrophosphate uptake in the myocardium, blood pool, and bone, and to assess the feasibility of early imaging compared to standard late imaging in participants with and without ATTR-CM. mage analysis involved visual assessments and quantitative metrics, including SUVmean, SUVmax, and percentage injected dose per milliliter, alongside relative uptake ratios.

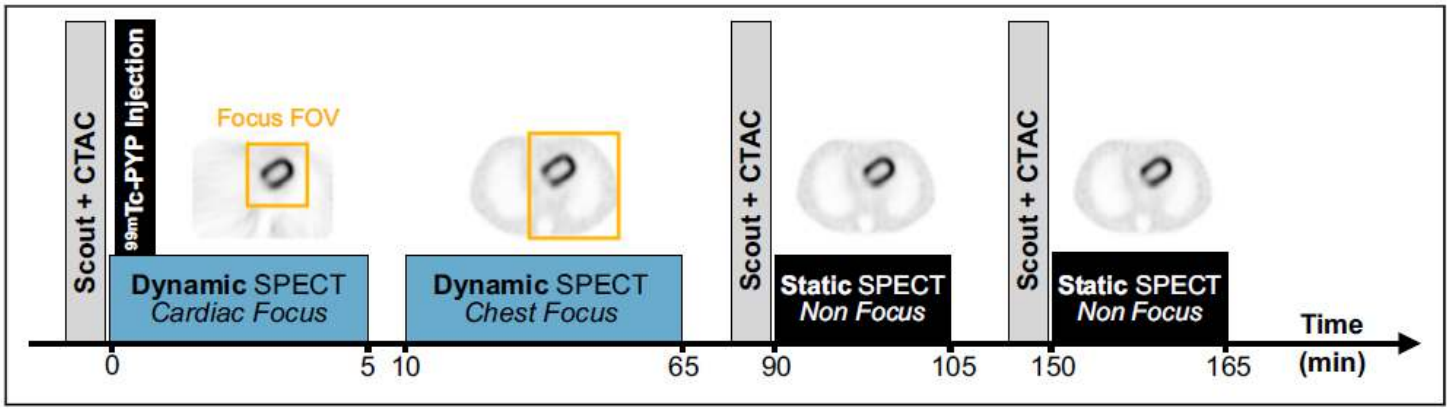
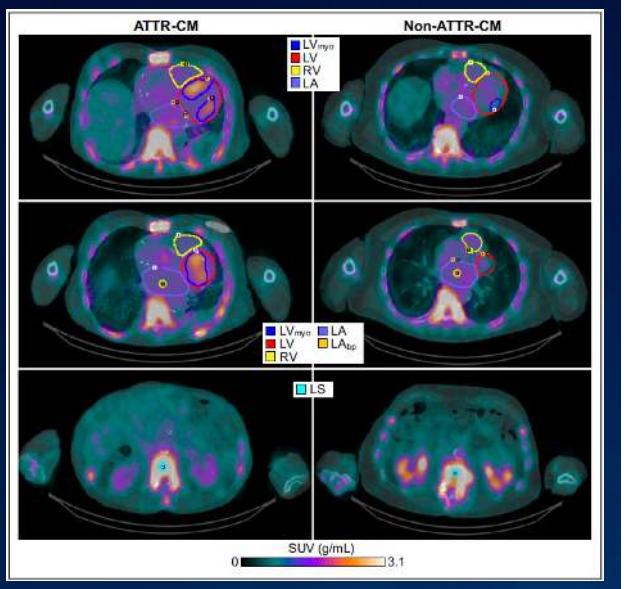
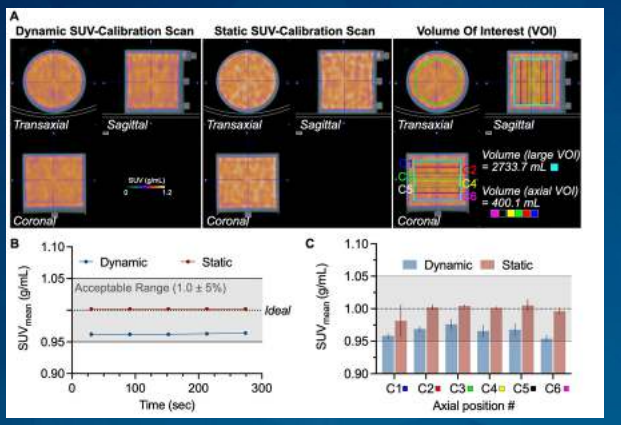


Figure 1. In the study design, the protocol takes advantage of VERITON-CT 4D (Dynamic SPECT/CT) quantitative capabilities as well as high sensitivity 3D imaging. Imaging includes a fast dynamic scan focused on the heart for the initial 5 minutes (for cardiac blood pool and perfusion), followed by a longer dynamic scan focused on the whole chest (for uptake kinetics and early washout kinetics). The 5-minute heart-focused dynamic scan achieved a temporal resolution of ~3 seconds. The subsequent 55minute dynamic scan covered a larger FOV, resulting in a slightly coarser temporal resolution of ~5 seconds. Later phase quantitative SPECT/CT follows traditional imaging guidelines.



Blood pool, myocardium, background and bone regions of interest



4D and 3D SUV accuracy

Article Takeaways

- Suggests the possibility that early imaging may be possible when using quantitative SPECT/CT, improving the efficiency of 99mTc Pyrophosphate protocols for assessment of ATTR-CM
- Early quantitative 99mTc-PYP SPECT/CT imaging can reliably differentiate ATTR-CM from non–ATTR-CM cases, reducing the need for a prolonged 2-to-3-hour uptake period, streamlining clinical workflows, improving participant comfort, and supporting timely disease management.
- VERITON-CT provides accurate SUV in 4D and 3D SPECT/CT acquisitions. Quantitative dynamic SPECT/CT with VERITON-CT now enables kinetic evaluation of radiopharmaceutical accumulation is human clinical and research applications.

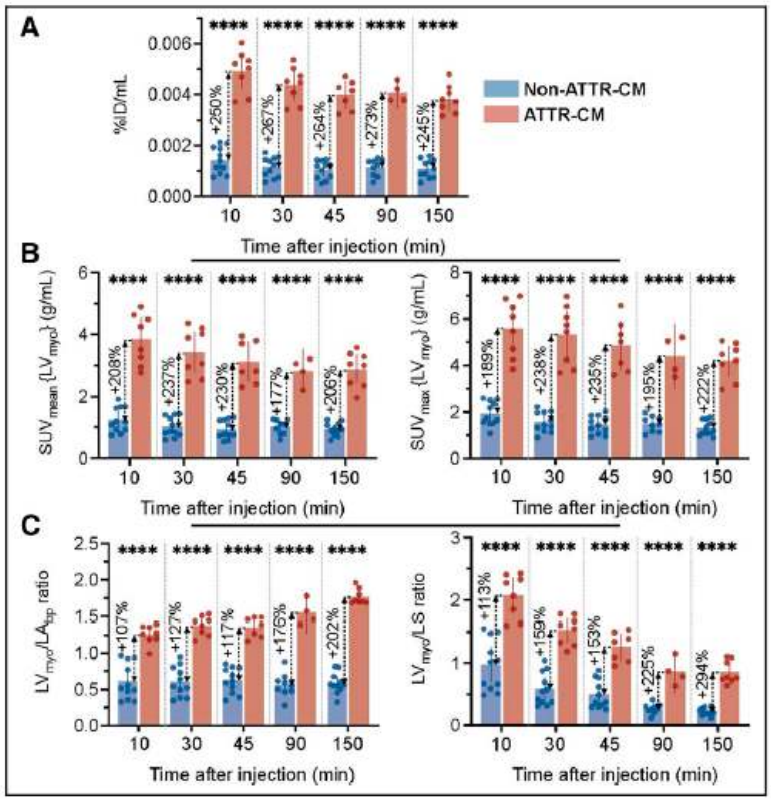


FIGURE 5. Comparison of absolute calibration-dependent and relative myocardial quantitative metrics between non–ATTR-CM and ATTR-CM groups for different periods. (A) Myocardial %ID/mL. (B) SUV_{mean} (left) and SUV_{max} (right) in LV_{myo}. (C) Semiquantitative SUV_{mean} ratios of myocardium to blood pool (LV_{myo}/LA_{bp}, left) and myocardium to bone (LV_{myo}/LA_{bp}, right). Data are presented as average ± 95% CI, with individual values shown as dots. *$P \leq 0.05$. **$P \leq 0.01$. ***$P \leq 0.001$. ****$P \leq 0.0001$. ns = not significant.

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